SMART FINANCIAL MAPPING: COMMUNITY MENTORING FOR DIGITAL BOOKKEEPING IN MICRO ENTERPRISES

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Abstract
Micro enterprises play a vital role in Indonesia's economic ecosystem, yet many continue to face serious challenges in managing their financial records due to low digital literacy and the absence of structured bookkeeping systems. This community service program, titled Smart Financial Mapping: Community Mentoring for Digital Bookkeeping in Micro Enterprises, aimed to empower micro business actors in Kelurahan Margodadi, Metro Selatan, through participatory mentoring focused on digital financial management. Using the Participatory Action Research (PAR) approach, the program was conducted over three months and involved training, mentoring, and monitoring activities using the BukuWarung mobile application. Data collection techniques included surveys, interviews, observations, and focus group discussions, while analysis combined quantitative statistical testing and thematic qualitative analysis. The results showed a significant improvement in financial literacy and digital bookkeeping practices, with increased confidence and behavioral change among participants. Despite some limitations related to digital access and literacy gaps, the mentoring approach proved effective in fostering long-term financial awareness. This program contributes to the development of inclusive digital transformation strategies for micro enterprises and highlights the value of sustained, community-based mentoring in achieving financial resilience.
Keywords: Digital Bookkeeping, Micro Enterprises, Participatory Mentoring, Financial Literacy, Community Empowerment.

Abstrak
Usaha mikro memainkan peran penting dalam ekosistem ekonomi Indonesia, namun banyak yang masih menghadapi tantangan serius dalam mengelola catatan keuangan mereka karena rendahnya literasi digital dan tidak adanya sistem pembukuan yang terstruktur. Program pengabdian masyarakat ini, bertajuk Pemetaan Keuangan Cerdas: Pendampingan Masyarakat untuk Pembukuan Digital pada Usaha Mikro, bertujuan untuk memberdayakan pelaku usaha mikro di Kelurahan Margodadi, Metro Selatan, melalui pendampingan partisipatif yang berfokus pada pengelolaan keuangan digital. Dengan menggunakan pendekatan Penelitian Aksi Partisipatif (PAR), program ini dilaksanakan selama tiga bulan dan meliputi kegiatan pelatihan, pendampingan, dan pemantauan menggunakan aplikasi seluler BukuWarung. Teknik pengumpulan data meliputi survei, wawancara, observasi, dan diskusi kelompok terfokus, sementara analisis menggabungkan uji statistik kuantitatif dan analisis kualitatif tematik. Hasilnya menunjukkan peningkatan yang signifikan dalam literasi keuangan dan praktik pembukuan digital, dengan peningkatan kepercayaan diri dan perubahan perilaku di antara para peserta. Meskipun terdapat beberapa keterbatasan terkait akses digital dan kesenjangan literasi, pendekatan pendampingan terbukti efektif dalam menumbuhkan kesadaran keuangan jangka panjang. Program ini berkontribusi pada pengembangan strategi transformasi digital inklusif bagi usaha mikro dan menyoroti pentingnya pendampingan berkelanjutan berbasis komunitas dalam mencapai ketahanan finansial.
Kata Kunci: Pembukuan Digital, Usaha Mikro, Pendampingan Partisipatif, Literasi Keuangan, Pemberdayaan Masyarakat.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) represent the backbone of many developing economies. In Indonesia, MSMEs account for more than 60% of the Gross Domestic Product (GDP) and employ the majority of the labor force (Irawan et al., 2023). Despite their significant contribution to national economic resilience, many micro enterprises still struggle with basic aspects of business management, particularly in the area of financial administration. The lack of adequate bookkeeping practices, especially digital-based bookkeeping, is one of the fundamental barriers that hinder their sustainability and potential for growth (Kumagai et al., 2019). This concern becomes even more critical in the context of rapid technological advancement and the growing necessity for data-driven decision-making in business.

Many micro business owners rely on informal and manual recording systems, such as notebooks or mental calculations, to manage their daily transactions. This often results in inaccurate financial information, making it difficult to track profits and losses, evaluate business performance, or access financial services such as loans and grants (Hughes, 2022). The COVID-19 pandemic further highlighted the fragility of such businesses, as many were unable to adapt quickly to digital transformations required for survival. This has amplified the urgency of building capacity in digital financial literacy and bookkeeping among micro enterprises (Maris et al., 2022).

Interestingly, despite numerous government and non-governmental programs aimed at empowering MSMEs, a significant gap remains between the available support and the actual needs of micro entrepreneurs, particularly in rural and semi-urban areas. Many of these programs tend to focus on macro-level interventions or short-term training with limited follow-up. The real challenge lies in sustained mentoring and contextualized solutions that align with the characteristics and readiness of local communities (Paunno et al., 2025). In this light, digital bookkeeping is not just a technical solution but also a form of empowerment that requires behavioral change, mindset shift, and continuous support.

This community engagement program, titled “Smart Financial Mapping: Community Mentoring for Digital Bookkeeping in Micro Enterprises”, is unique in its approach. It does not merely provide training but offers an integrated mentoring process that facilitates the adaptation of digital bookkeeping systems tailored to the specific contexts of each business. The program focuses on empowering micro entrepreneurs through a bottom-up approach beginning with needs assessment, trust-building, and gradual digital adoption. This allows the initiative to move beyond traditional training frameworks and foster real transformation through participatory learning and peer collaboration.

Unlike previous community service programs that often adopt a one-size-fits-all model, this initiative addresses a critical gap in previous interventions: the lack of sustained assistance and limited usability of digital tools in low-literacy settings. Many digital platforms introduced to MSMEs are too complex or poorly localized, which leads to low adoption rates (Decuypere et al., 2021). Our mentoring approach introduces a simplified bookkeeping application combined with regular follow-ups, user-friendly manuals, and ongoing consultation. Furthermore, this program harnesses the power of local mentors community facilitators who are trained not only in technical knowledge but also in soft skills to assist micro business actors consistently (Johnson, 2020).

The objective of this article is to describe and reflect on the design, implementation, and outcomes of the Smart Financial Mapping program as a model of community mentoring for digital bookkeeping. Specifically, it seeks to identify how participatory mentoring can improve the financial literacy and digital readiness of micro businesses, assess the effectiveness of digital bookkeeping adoption, and provide a replicable framework for similar initiatives in other regions. Additionally, the article aims to analyze the transformation in the financial behavior of participants before and after the intervention.

Through this scientific community service article, the authors hope to contribute to the discourse on inclusive digital transformation in MSMEs. It is expected that the findings and reflections presented here will inspire policymakers, educators, and practitioners to develop more grounded, responsive, and sustainable empowerment programs for micro enterprises. Furthermore, this initiative underscores the importance of digital equity and the role of educational institutions in bridging the digital divide through community engagement. Ultimately, this program envisions the creation of digitally literate, financially responsible micro entrepreneurs who are resilient, adaptive, and competitive in a changing economic landscape.

METHOD

This community service program employed the Participatory Action Research (PAR) approach, which emphasizes collaboration, reflection, and iterative improvement in addressing community issues. PAR was chosen to ensure that the process of mentoring micro enterprises in digital bookkeeping would be participatory, adaptive, and contextually grounded. The focus of this engagement was not merely to transfer knowledge, but to co-create solutions with community members, particularly micro entrepreneurs, through continuous involvement and mutual learning.

The primary target group of this community engagement activity consisted of 25 micro business actors operating in Kelurahan Margodadi, Kecamatan Metro Selatan, Kota Metro, Lampung. These participants were selected based on their business informality, lack of structured financial records, and willingness to engage in digital transformation. Most of the businesses were in the culinary, grocery, and home-based service sectors. The community partner (mitra) involved was the Kelurahan Margodadi Office, along with representatives from the local economic empowerment program (PKK and Karang Taruna). These partners were crucial in mobilizing participants, legitimizing the program, and providing logistical and communication support.

The engagement activities were conducted over a period of three months, from February to April 2025, at several community centers and business locations within Kelurahan Margodadi. The stages of the PAR-based mentoring process were as follows:

The initial phase began with a comprehensive planning and coordination process involving the academic team and local stakeholders. Prior to field activities, coordination meetings were held with local government and community leaders to present the goals of the program and to obtain formal permissions. Ethical considerations and consent procedures were addressed during this stage, ensuring that all parties involved understood the scope and expected outcomes of the project.

Following the approval process, a preliminary field survey was conducted using semi-structured interviews and observational checklists to map the digital literacy, financial behavior, and challenges faced by micro entrepreneurs. This data served as a baseline and was also used to tailor the mentoring module. During this phase, data collection techniques included participant observation, structured questionnaires, in-depth interviews, and focused group discussions (FGDs). Data sources came from both primary informants (the business actors themselves) and secondary documents such as previous training records and local government reports.

After mapping the local needs, the mentoring and facilitation phase was carried out. This phase began with a two-day workshop introducing basic digital bookkeeping concepts and hands-on training using a simplified mobile-based application compatible with Android devices. The application used was “BukuWarung,” chosen for its user-friendliness, offline capability, and suitability for small-scale financial tracking. Following the workshop, the mentoring was conducted weekly through field visits, virtual check-ins, and peer-sharing sessions for a total of eight weeks. The mentoring team consisted of university lecturers, students, and local volunteers trained in facilitation techniques.

To ensure continuous feedback, a monitoring system was implemented, where participants recorded their progress and challenges through reflective logs and were observed by facilitators using performance indicators such as frequency of app usage, accuracy of entries, and confidence in explaining their financial reports. Monitoring also involved regular debriefings among mentors and facilitators to assess changes and adjust strategies as necessary.

The final stage was the evaluation and reflection phase. This included post-intervention interviews, comparison of pre- and post-tests on financial literacy, and analysis of bookkeeping practices before and after the intervention. Quantitative data from the pre- and post-tests were analyzed using descriptive statistics and Pearson correlation tests to examine the relationship between digital literacy improvement and financial management performance. Qualitative data from interviews and FGDs were analyzed thematically using coding and triangulation to ensure validity and reliability.

The data analysis process combined both quantitative and qualitative techniques. Quantitative data were processed using SPSS software, and correlation analysis was employed to explore the link between participants' digital proficiency and improvements in financial documentation. Meanwhile, qualitative data were transcribed and analyzed using NVivo software to extract recurring themes, participant perceptions, and contextual insights. These findings were then interpreted collaboratively with participants in a concluding participatory evaluation session, ensuring that community voices remained central to the final conclusions.

RESULTS AND DISCUSSION

The implementation of the Smart Financial Mapping community mentoring program yielded significant outcomes, both in terms of quantitative improvements and qualitative transformations among micro enterprise participants. Through a structured participatory process and sustained mentoring, the participants demonstrated measurable progress in their ability to manage financial records using digital tools, as well as increased awareness of the importance of bookkeeping for business sustainability. The results indicated a positive correlation between the mentoring activities and the improvement of digital financial literacy and application usage in daily business operations.

Quantitatively, data from the pre- and post-test assessments revealed a considerable increase in financial literacy scores. Before the intervention, the average financial literacy score of participants was 51.3 (on a scale of 100), indicating low understanding of basic financial concepts such as income tracking, expense classification, and profit calculation. After eight weeks of mentoring and digital practice, the average score rose to 81.7, reflecting a strong grasp of fundamental bookkeeping principles. This improvement was statistically tested using a paired sample t-test, which showed a significant difference ($p < 0.01$) between pre- and post-intervention scores. Additionally, a Pearson correlation analysis revealed a moderate positive correlation ($r = 0.64$) between digital literacy gains and increased frequency of bookkeeping using the mobile app, suggesting that digital skills directly supported improved financial documentation practices.

From a behavioral standpoint, 84% of participants were able to consistently use the BukuWarung application for at least six consecutive weeks, entering income and expense data with increasing accuracy. Prior to the program, only three participants had ever used any form of digital bookkeeping, and none had maintained consistent records. By the end of the mentoring period, 21 out of 25 participants demonstrated the ability to generate simple financial reports from the app, understand their business cash flow, and use that information to make daily business decisions, such as controlling purchases or planning for savings.

Qualitative data supported these quantitative findings. Thematic analysis of in-depth interviews and focus group discussions indicated five major themes: (1) increased awareness of financial transparency; (2) improved confidence in business management; (3) growing interest in using other digital tools; (4) peer learning as a motivator for consistency; and (5) a shift from reactive to proactive business decisions. Many participants expressed that, for the first time, they understood how much profit they actually earned and could distinguish between personal and business expenses. One female participant stated, "Now I can see that I was losing money even though I thought I was earning. The app opened my eyes."

Furthermore, the participatory mentoring model fostered a sense of ownership and accountability. Participants reported that regular follow-ups and peer-group check-ins helped them stay motivated and disciplined in recording transactions. Unlike typical one-time training, this model encouraged reflective practice and mutual support among the micro business owners (Bell & Bell, 2020). Several participants initiated informal WhatsApp groups to share tips, ask questions, and celebrate small wins, such as reaching a savings target or improving sales.

From a community development perspective, the program also led to an unexpected yet welcome outcome: the emergence of local "digital champions" among the participants. These were individuals who mastered the app quickly and voluntarily assisted others during mentoring sessions. This internal leadership helped maintain the sustainability of the initiative beyond the formal mentoring schedule and was later integrated into the program's exit strategy by training these champions to become peer facilitators (Hurd & Stanton, 2023).

Monitoring and observation also revealed changes in the business habits of participants. Several business owners began to separate business cash from personal funds, create simple budgets, and reflect more carefully on product pricing. These behavioral adjustments are significant, as they represent a shift toward more professional business practices, even within an informal sector context. Participants also noted improvements in their ability to communicate financial matters with family members and potential investors, as they now had concrete data to support their decisions.

Despite these positive developments, the results also revealed a few challenges. Some participants struggled with inconsistent internet access, limited device capacity (e.g., outdated smartphones), and initial fear of using digital tools. However, these issues were mitigated through flexible mentoring approaches, such as offline sessions, printed guides, and buddy systems. Moreover, participants emphasized that patience and trust from the facilitators played a crucial role in their willingness to persist through initial difficulties.

Figure 1. Community Mentoring for Digital Bookkeeping in Micro Enterprises.

The results of this community engagement program indicate a clear progression in the digital financial literacy and behavioral transformation of micro entrepreneurs. When juxtaposed with previous community service initiatives, especially those involving digital training for MSMEs, this program offers a more holistic, sustained, and participatory model. Earlier studies, such as those conducted by (Nisar et al., 2022), often reported limited effectiveness of digital financial education due to the short duration of training and lack of follow-up support. In contrast, this initiative's use of a Participatory Action Research (PAR) approach and extended mentoring proved to be critical in ensuring not only knowledge transfer but behavioral adaptation (Montes et al., 2021). Participants were not passive learners but active co-developers of solutions, which led to deeper learning and long-term habit formation.

The transformation observed in participants aligns with Vygotsky's (1978) sociocultural theory, which emphasizes the importance of social interaction in cognitive development. Through collaborative learning, peer mentoring, and guided facilitation, participants moved from zones of proximal development initial unfamiliarity with digital bookkeeping to autonomous use of financial applications (Cueto et al., 2022). The presence of peer learning groups and local "digital champions" further confirms that learning is enhanced in socially supported environments, reinforcing the theoretical claim that community plays a critical role in individual capacity-building.

Moreover, the adoption of digital bookkeeping tools by the majority of participants confirms the applicability of Davis' (1989) Technology Acceptance Model (TAM) in microbusiness contexts. According to TAM, perceived usefulness and perceived ease of use are the two main determinants of technology adoption. In this program, the selection of the BukuWarung app a platform that is user-friendly, mobile-based, and suitable for businesses with low capital enabled participants to perceive tangible benefits early in the process. When the application allowed them to view profit margins, track expenses, and project sales, participants reported a sense of empowerment and increased motivation to continue using the technology (Titin et al., 2024).

This result stands in contrast to findings from earlier engagements, such as those by Handayani & Setiawan (2020), which reported high dropout rates in MSME digital training programs. Those failures were often linked to the use of complex financial software, misalignment with participants' literacy levels, and the lack of localized mentoring. In the present program, the combination of easy-to-use technology and human facilitation addressed these barriers, suggesting that digital tools alone are insufficient without human-centered strategies that consider the learner's context.

From a behavioral change perspective, the positive shift in financial habits such as separating personal and business finances and creating daily records reflects the relevance of Ajzen's (1991) Theory of Planned Behavior. Participants' behavioral intentions were shaped not only by the knowledge imparted but by subjective norms (peer support and group accountability) and perceived behavioral control (the simplicity and accessibility of the application) (Ahmetaj et al., 2023). Over time, participants demonstrated an increase in self-efficacy, which is a key predictor of consistent behavior in financial management practices.

Another important aspect is the socio-economic implication of this transformation. Micro businesses often operate in fragile environments with limited access to formal financial systems. The improved ability to document income and expenses allowed some participants to approach local cooperatives and savings groups with actual data, increasing their chances of accessing microcredit or participating in collective savings schemes. This resonates with the findings of (Baumüller & Sopp, 2021), who argued that one of the key constraints for MSMEs in accessing financing is the absence of transparent and verifiable financial records. The shift observed in this program implies that digital bookkeeping can act as a gateway for formal financial inclusion when appropriately introduced and mentored.

From a broader development perspective, this community engagement model advances the Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation, and Infrastructure). By enhancing digital literacy and promoting inclusive innovation through community mentoring, the program contributed to building entrepreneurial resilience and improving economic productivity at the grassroots level. The use of local mentors and the participatory design also aligned with SDG 17 (Partnerships for the Goals), demonstrating the importance of collaboration between universities, communities, and local governance structures (Ziso et al., 2022).

Despite the success, the analysis also acknowledges that digital transformation in micro enterprises remains uneven. A small group of participants required more time and individualized support, and a few struggled with consistent internet access and outdated mobile devices. This echoes the findings of (Endris & Kassegn, 2022), who noted that the digital divide continues to marginalize small entrepreneurs unless accompanied by infrastructural and policy support. Thus, while this program demonstrated that human-centered mentoring can bridge part of the gap, larger systemic interventions are still necessary to create equitable access to digital infrastructure.

CONCLUSION

This community engagement initiative, Smart Financial Mapping: Community Mentoring for Digital Bookkeeping in Micro Enterprises, was driven by a fundamental concern: the persistent vulnerability of micro enterprises due to their lack of structured financial management, particularly in adapting to digital solutions. Through a participatory mentoring model grounded in the PAR approach, the program successfully addressed this concern by equipping micro entrepreneurs not only with technical skills but also with a deeper understanding of financial literacy and accountability. The active involvement of participants, the contextual use of user-friendly mobile applications, and the emphasis on behavioral transformation marked a significant step toward sustainable digital adaptation in the informal business sector.

However, the program also encountered several limitations. Not all participants progressed at the same pace due to disparities in digital access, varying literacy levels, and differing motivations. While peer support and simplified tools helped mitigate these gaps, a longer mentoring period and more personalized follow-up may be required for consistent adoption across all groups. Additionally, the sustainability of behavior change remains dependent on continued community support and potential integration with broader economic development policies.

Moving forward, future community service programs should consider deeper collaboration with local governments and financial institutions to create an ecosystem that supports digital financial inclusion beyond the intervention period. Incorporating digital infrastructure assistance, developing offline-compatible tools, and training local peer mentors can help scale the impact. More importantly, the spirit of participatory engagement must be preserved, as genuine transformation occurs when communities are not merely taught but empowered to lead their own change.

ACKNOWLEDGE

Thank you to several service teams from various universities both in terms of thought, energy, and material, until the completion of this service activity. It is hoped that this collaboration will continue to provide many benefits to the wider community.

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